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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RAJENDRA KASHINATH SINGH and
YE-GANG LIN

Appeal 2008-0508
Application 10/604,166
Technology Center 1700

Decided: March 31, 2008

Before CATHERINE Q. TIMM, LINDA M. GAUDETTE, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

1 Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's
decision rejecting claims 1-29. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

I. BACKGROUND

The invention relates to a fire-retardant transparent polycarbonate composition. Claim 1 is illustrative of the subject matter on appeal:

1. A polycarbonate composition comprising:
 - (a) polycarbonate produced in a base-catalyzed melt polymerization reaction to which an acidic quencher has been added in a 1 to 30-fold molar ratio with respect to the amount of initial basic catalyst; and
 - (b) a flame-retardant component comprising a potassium perfluoroalkane sulfonate and a cyclic siloxane, wherein components (a) and (b) work in combination such that the composition achieves a V0 UL flammability rating at a thickness of 2 mm and has a haze of no more than 1%.

The grounds of rejection to be reviewed are:

1. The rejection of claims 1-29 under 35 U.S.C. § 112, ¶ 1 for lack of enablement;
2. The rejection of claims 1-29 under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over Rosenquist et al. (US 6,353,046 issued Mar 5, 2002);
3. The rejection of claims 1-29 under 35 U.S.C. § 103(a) as unpatentable over Rosenquist in view of Sakashita et al. (US 5,606,007 issued Feb. 25, 1997) and Mestanza (US 6,136,945 issued Oct. 24, 2000); and
4. The rejection of claims 1-29 under 35 U.S.C. § 103(a) as unpatentable over Mark et al. (US 4,130,530 issued Dec. 19, 1978) in view of Rosenquist and Nouvertne (US 3,775,367 issued Nov. 27, 1973).

II. DISCUSSION

Enablement

Turning first to the rejection under 35 U.S.C. § 112, ¶ 1 for lack of enablement, we note that the initial burden of presenting reasons or evidence to support this type of rejection rests with the Examiner, and, if met, the burden shifts to Appellants. *See In re Wright*, 999 F.2d 1557, 1561-62 (Fed. Cir. 1993). Specifically, the Examiner must advance acceptable reasoning inconsistent with enablement. Thereupon, the burden shifts to Appellants to show that one of ordinary skill in the art could have practiced the claimed invention without undue experimentation. *In re Strahilevitz*, 668 F.2d 1229, 1232 (CCPA 1982); *see also Wright*, 999 F.2d at 1561 (“Although not explicitly stated in section 112, to be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without ‘undue experimentation.’”).

The Examiner bases the rejection on the fact that Appellants’ claim 1 recites the use of an acidic quencher in a particular range of molar ratios, but Tables 1 and 2 in the Specification presents results for two specific acidic quenchers, butyl tosylate and phosphorous acid, within the claimed ratio that do not result in the claimed V0 UL flammability rating.

As pointed out by Appellants, the examples relied upon by the Examiner are not within the scope of the claim as they do not meet the V0 UL flammability requirement (Br. 3). The claims require both the molar ratio and the flammability rating. Only those polycarbonate compositions meeting both requirements are within the scope of the claim. The fact that the Specification includes examples outside the scope of the claim does not alone provide sufficient evidence that the full scope of the claims lack

enablement. The claim is written to encompass other acidic quenchers and the molar ratio must be viewed as applying to all known acid quenchers. The Specification indicates that a range of acids were known in the art and could be selected (Spec. ¶ 0015). In meeting the initial burden, the Examiner must take into account the knowledge of those of ordinary skill in the art and the unpredictable nature of the art. *In re Bowen*, 492 F.2d 859, 862 (CCPA 1974). The question is whether, once imagined, other embodiments could be made without difficulty and their performance characteristics predicted by resort to known scientific laws or whether unpredictability is such that it would be difficult for the ordinary artisan to extend the teaching to other embodiments. *Id.* It appears from the Specification as a whole, which provides a general discussion of acid quenchers, their purpose, and guidance on concentration levels, that only routine experimentation would be required to determine the operable embodiments.

The Examiner has not provided a basis to conclude that the examples of Tables 1 and 2 are inconsistent with enablement. Moreover, other evidence within the Specification supports enablement and the Examiner has not provided sufficient reasons to doubt those portions of the Specification.

The Rejection over Rosenquist

Turning to the second rejection, i.e., the rejection over Rosenquist, we find this rejection lacking sufficient support as well. The Examiner advances two rationales to support the rejection. First, the Examiner relies upon Example 2 (Tables 2A and 2B) as describing the claimed polycarbonates even though this example is silent with respect to melt polymerizing with a base catalyst and adding an acid quencher, shifting the

burden to Appellants to show that the composition differs from that claimed, the “difference” being a difference in process rather than a difference in composition (Ans. 5). Second, the Examiner relies upon Rosenquist’s suggestion that the process taught by Sakashita was known in the art and determines that the polycarbonate of Rosenquist would encompass the claimed polycarbonate (Ans. 5-6).

We agree that it is sometimes acceptable, when a product claim contains a process limitation, to base a rejection alternatively on either section 102 or section 103 on the theory that a prior art product reasonably appears to be either identical with or only slightly different than the claimed product. But the Examiner must provide sufficient basis in fact or technical reasoning supporting the determination of identity or substantial identity.

In the present case, however, the claimed melt polymerization process includes the addition of a catalyst and an acidic quencher. There is no evidence here that the catalyst completely disappears from the product. Appellants’ Specification indicates that the acidic quencher in the claimed amount will neutralize some but not all of the catalyst. Pockets of residual base sufficient to affect the properties of the composition will remain (Spec. ¶ 0016).

Example 2 of Rosenquist is completely silent with respect to the process by which the polycarbonate was polymerized. Moreover, the first paragraph of column 2, indicates that various polymerization processes were known in the art. While it may have been obvious to one of ordinary skill in the art to select one of the known processes disclosed in column 2, we cannot agree that Rosenquist “describes” a polycarbonate with sufficient

specificity to shift the burden to Appellants to show that the claimed product is, in fact, different from that of Rosenquist's Example 2.

With respect to the Examiner's second basis for rejecting the claims, i.e., that Rosenquist would encompass the claimed polycarbonate because the reference discloses that the process of Sakashita was well known in the art, we also cannot agree that this provides a basis for anticipation.

"[R]jections under 35 U.S.C. § 102 are proper only when the claimed subject matter is identically disclosed or described in 'the prior art.'" *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). We note that the Examiner has not, in the context of this rejection, provided an obviousness rationale.

We conclude that the Examiner has not established unpatentability over Rosenquist in the context of the rejection under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a).

Obviousness

The rejections based on obviousness over Rosenquist in combination with Sakashita and Mestanza or those references along with Mark and Nouvertne stand on different footing. Rosenquist expressly suggests using the process of Sakashita, a process referenced by Appellants as a base-catalyzed melt polymerization with acid quenching (Spec. ¶¶ 0011 and 0015), to polymerize polycarbonate. Mestanza also describes a melt polymerization process meeting the requirements of claim 1. Sakashita suggests using molar ratios of acidic quencher to basic catalyst encompassing those claimed (Sakashita, col. 8, ll. 22-26).¹ Moreover, the

¹ While Sakashita bases the mole ratio on the amount of base catalyst (alkaline compound) remaining in the polycarbonate, theoretically, that amount should be roughly the same as the initial base catalyst (the basis of Appellants' claims). Catalysts are not consumed during reaction. Therefore, it is reasonable to conclude that the molar ratios of the claims can be directly

prior art evinces a desire to optimize for V0 UL flammability rating while minimizing haze (retaining the high clarity of the polycarbonate) (Rosenquist, col. 1, ll. 7-20), haze being minimized by limiting the amount of perfluoroalkane sulfonate flame retardant (Rosenquist, col. 2, ll. 24-30) and using cyclic siloxane to synergistically improve the fire-retardant properties (Rosenquist, col. 3, ll. 5-18).

Appellants are claiming a composition incorporating known components in known concentrations to yield predictable properties. The evidence, *prima facie*, supports a conclusion of obviousness. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739 (2007); *see also In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (“[T]he existence of overlapping or encompassing ranges shifts the burden to the applicant to show that this invention would not have been obvious.”); *and In re Boesch*, 617 F.2d 272, 276 (CCPA 1980) (“[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.” (Citations omitted)).

We note that both of the Examiner’s obviousness rejections rely upon Rosenquist, Sakashita, and Mestanza as evidence of obviousness. Discussion of Mark and Nouvertne is not necessary; we sustain both obviousness rejections for the reasons given above.

Under the heading “The Evidence is Commensurate with the Scope of the Claims,” Appellants refer to a “showing” (Br. 8). Appellants’ Briefs do not identify this “showing,” however, it appears that Appellants are relying

compared to those of Sakashita.

upon the data presented in Tables 1 and 2 located between ¶¶ 0027 and 0028 and ¶¶ 0029 and 0030 of the Specification, respectively.² Tables 1 and 2 are reproduced below.

Table 1									
	<u>Batch 1</u>	<u>Batch 2</u>	<u>Batch 3</u>	<u>Batch 4</u>	<u>Batch 5</u>	<u>Batch 6</u>	<u>Batch 7</u>	<u>Batch 8</u>	<u>Batch 9</u>
Butyl Tosylate	0	0.6	1	1.5	3.6	5	7.5	10	15
(ppm)									
Butyl Tosylate /	0	1.2	2.4	3.6	8.5	12.1	18.1	24.2	36.2
Na Ratio									
5-Bar FOT (s)*	43.8	38.8	34.4	32	29.2	31.9	33	35.4	37.9
Flame Drips	13 of 20	2 of 20	0 of 20	0 of 20	0 of 20	0 of 20	0 of 20	0 of 20	1 of 20
UL Rating	V2	V2	V0	V0	V0	V0	V0	V0	V2

Table 2				
	<u>Batch 1</u>	<u>Batch 2</u>	<u>Batch 3</u>	<u>Batch 4</u>
45 %Phosphorous Acid (ppm)	1	2	3	5
Phosphorous Acid/Na ratio	6.1	12.1	18.3	30.5
5-Bar FOT (s)*	31.1	35	37.4	39.9
Flame Drips	0 of 20	0 of 20	0 of 20	2 of 20
UL Rating	V0	V0	V0/V1	V2

Appellants contend that the evidence is commensurate in scope for various groups of claims (Br. 8-11).

As a first matter, once a prima facie case of obviousness is established, the burden of coming forward with evidence and argument in rebuttal is shifted to the appellant. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984). Appellants have not concretely stated how they are relying upon their data, but it appears they are attempting to show the claimed compositions possess unexpectedly improved properties. “In order for a showing of ‘unexpected results’ to be probative evidence of non-obviousness, it falls upon the applicant to at least establish: (1) that

² The Tables are reproduced in the Amendment to the Specification filed October 26, 2005 submitted with a receipt showing they were filed with the original Specification.

there actually is a difference between the results obtained through the claimed invention and those of the prior art, ... and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of invention.” *In re Freeman*, 474 F.2d 1318, 1324 (CCPA 1973) (citations omitted).

Appellants in their Briefs do not point to any statement declaring what results would have been considered unexpected. The most relevant statement we could find is located in the Specification at paragraph 9.

According to this portion of the Specification,

The present invention is based on several surprising observations. First, it was observed by the inventors that polycarbonate produced via a base-catalyzed, for example sodium hydroxide-catalyzed, melt polymerization has a significantly higher solubility for perfluoroalkane sulfonates without loss of transparency. Secondly, the flame retardancy of the perfluoroalkane sulfonate was significantly improved by the presence of the residual base catalyst. Furthermore, it appears that there is an optimum range of residual base catalyst that allows enhancement of flame performance. Excessive base catalyst can result in the decay of flame performance. In this invention, the optimum level of residual base catalyst is achieved by controlling the acid quencher loading to a level which is in the range of 1-30 fold molar ratio with respect to the initial base catalyst.

(Spec. ¶ 0009).

Based on the above, it appears that Appellants believe there is a difference in result (flame retardancy) based upon the presence of residual base catalyst from the melt polymerization process. But Appellants’ data does not compare flame retardancy results between their claimed polycarbonates and non-base catalyzed polycarbonates. In other words,

Appellants have not compared their claimed polycarbonate with that of the closest prior art, i.e., Rosenquist. *See In re Baxter Travenol Labs*, 952 F.2d 388, 392 (Fed. Cir. 1991) (The “difference in results” must be established as being between the claimed subject matter and the closest prior art.). Nor, given the prior art discussion of flame retardancy and haze, can we say Appellants’ statement in the Specification about “surprising observations” is enough to show the results of Tables 1 and 2 would have been unexpected to one skilled in the art such that the totality of the evidence supports a conclusion of non-obviousness. In order to properly evaluate whether a property would have been unexpected, we must consider what properties were expected. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1371 (Fed. Cir. 2007). Moreover, “[a]lthough secondary considerations must be taken into account, they do not necessarily control the obviousness conclusion.” *Id.*, 480 F.3d at 1372.

The above deficiencies apply to all the claims.

We also agree with the Examiner that Appellants have not established that the data is commensurate in scope with the claims. *In re Greenfield*, 571 F.2d 1185, 1189 (CCPA 1978) (“Establishing that one (or a small number of) species gives unexpected results is inadequate proof, for ‘it is the view of this court that objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support.’” (Quoting *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971))). While Appellants state that the two acids tested are fairly representative of the broad class of acidic compounds encompassed by the broad claims, this statement is not supported by evidence, it is only attorney argument. *See*

In re Soni, 54 F.3d 746, 750 (Fed.Cir.1995) (“It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice.”).

Nor is the data commensurate in scope with the claims limited to butyl tosylate and phosphorous acid. For example, only polycarbonates containing 0.8 % cyclic octaphenyl siloxane were tested. None of the claims are limited to this particular siloxane in this amount, nor have Appellants shown this siloxane to be representative of all the cyclic siloxanes encompassed by the claims.

Based on the totality of record, including due consideration of the Appellant’s arguments, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the meaning of 35 U.S.C. § 103.

III. CONCLUSION

In summary, we

do not sustain the rejection under 35 U.S.C. § 112, ¶ 1;

do not sustain the rejection under 35 U.S.C. § 102(b) or, in the alternative, under 35 U.S.C. § 103(a) over Rosenquist;

sustain the rejection under 35 U.S.C. § 103(a) over Rosenquist in view of Sakashita and Mestanza; and

sustain the rejection under 35 U.S.C. § 103(a) over Mark in view of Rosenquist, Nouvertne, Sakashita, and Mestanza.

IV. DECISION

The decision of the Examiner is affirmed.

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V. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

tf/ljs

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